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Surgical Approach to a Challenging Penoscrotal Elephantiasis in a Young Male: A Case Report

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Abstract Penoscrotal elephantiasis is a severe form of genital lymphedema characterized by disfiguring edema, functional and psychosocial challenges. This case report chronicles the 16-year clinical course (2008-2024) of a 22-year-old male with congenital lymphatic malformation. He underwent several interventions, including partial scrotal resection, sirolimus therapy and sclerotherapy, with limited success. A significant clinical improvement was observed following radical scrotal orchiectomy on August 14th, with the resection of approximately 5 kg of fibrofatty tissue. The postoperative SF-12 survey showed significant physical improvement despite mild swelling. A structured, multidisciplinary approach and vigilant follow-up are crucial for sustaining outcomes and addressing residual or recurrent disease.

Key Words Penoscrotal Elephantiasis, Genital Lymphedema, Congenital Lymphatic Malformation, Radical Excisional Surgery

INTRODUCTION

Penoscrotal elephantiasis denotes an advanced stage of genital lymphedema arising from protracted lymphatic obstruction in the external genitalia [1]. The condition often culminates in massive fibrofatty deposition, thickened skin and chronic inflammation that undermines functional capacity and quality of life. Although filariasis remains a leading cause globally, congenital lymphatic malformations can produce similarly disruptive presentations [2]. Conservative measures, including compression and manual lymphatic drainage, typically offer limited respite once extensive fibrosis is established. Pharmacological interventions, particularly sirolimus and Interventional Radiology (IR) sclerotherapies frequently yield partial or short-lived relief in advanced cases [3].

Ultimately, radical surgical excision plays a cornerstone in definitive management, accompanied by careful reconstruction to preserve or restore normal anatomy and function [1]. This case report chronicles the 16-year journey (2008-2024) of a young male with congenital lymphatic malformation who underwent multiple partial resections, repeated sclerotherapies and sirolimus therapy before achieving substantial relief through an extensive scrotal excision on August 14, 2024. His postoperative course underscores the significance of multidisciplinary follow-up to address any residual swelling or psychosocial concerns.

Case Presentation

Longstanding Disease Course (2008-2024)

In 2008, at the age of six, the patient presented with the initial manifestation of bilateral lower-limb edema of unknown origin. Imaging studies excluded malignant or obstructive etiologies within the abdomen and pelvis. By the age of nine in 2011, the swelling had extended to the scrotum and penis, compromising both hygiene and mobility. Repeated ultrasound examinations revealed diffuse subcutaneous thickening and bilateral hydroceles, with no evidence of compressive lesions or significant lymphadenopathy. Conservative approaches, such as limb elevation, compression garments and physiotherapy, exerted minimal impact on the progressive nature of the disease.

Partial Scrotal Excision in March 2017

In March 2017, at the age of 14, the patient underwent a partial scrotal excision to address progressive scrotal swelling. The surgical approach involved dissection and

resection of the diseased scrotal skin, preserving lateral skin flaps for subsequent reconstruction. Concurrently, the midline perineal skin was excised. Multiple hydrocele cavities were drained, followed by partial excision and eversion of the tunica vaginalis. Two scrotal pockets were created within the remaining healthy flaps to accommodate the testes. To improve penopubic angulation, diseased tissue at the penile base was removed. This surgical intervention provided moderate symptomatic relief for approximately two years, after which scrotal swelling recurred.

Sirolimus Therapy and Interventional Sclerotherapies (2017-2023)

Between 2017 and 2022, an endocrinologist was integrated into our multidisciplinary team to address borderline hypogonadism and bilateral gynecomastia. During this time, the patient's scrotal swelling progressed. Therefore, Sirolimus therapy was initiated in April 2022 at a dose of 1 mg/day. The dosage was increased to 3 mg/day in May 2022 but ultimately discontinued in December 2022 due to minimal impact on the predominantly non-pitting edema.

By September 2023, further sirolimus treatment was considered, but ongoing scrotal enlargement necessitated a different approach. Two interventional radiology-guided (IR) sclerotherapy procedures were performed. The first, an intranodal lymphangiogram with glue embolization in March 2023, resulted in only temporary size reduction. A second sclerotherapy procedure was performed in November 2023 under general anesthesia and ultrasound guidance. Interventional radiologists accessed the malfunctioning lymphatic channel in the left upper scrotum and injected a combination of 1 mL of glue and 6 mL of Lipiodol. Unfortunately, similar to the previous attempt, this intervention provided only a transient decrease in scrotal volume and did not achieve a lasting resolution.

Radical Excisional Surgery in August 2024

Conservative, pharmacologic and IR modalities eventually proved insufficient, resulting in limited improvements. Consequently, the multidisciplinary team recommended a radical scrotal excision. On August 14, 2024, the patient underwent surgery under general anesthesia. The patient was positioned in the lithotomy position (Figure 1). A broad elliptical incision was made, encompassing the scrotal and penile skin extensively involved by lymphatic malformation. Approximately 4.935 kg of fibrotic and edematous tissue were removed (Figure 2). Minor tears in each testicle discovered during dissection were promptly sutured and the integrity of both spermatic cord structures was maintained. Hemostasis was maintained throughout the procedure. Reconstructive steps included deep tissue approximation and bilateral orchiopexy (Figure 3a, b), anchoring each testis to the lateral and inferior scrotal walls to prevent torsion or malposition. Finally, a layered external closure was performed to define the final scrotal contour. As illustrated in Figure 4, the closure was executed to ensure wound stability and facilitate postoperative mobility. The patient tolerated the operation without complications.

Figure 1: Preoperative photograph demonstrating enlarged penoscrotum in lithotomy position prepped with antiseptic

Figure 2: Intraoperative photograph of the excised scrotal tissue weighing 4.935 kg

Postoperative SF-12 Assessment

Following the radical excision, the patient's health-related quality of life was assessed using the 12-Item Short Form Survey (SF-12, version 1.0) in January 2025 [4]. The Physical Component Score (PCS-12) was 55.97, demonstrating a significant improvement compared to the U.S. population mean of 50. This substantial elevation

Figure 3(a-b): Bilateral orchiopexy, anchoring both testes to the lateral and inferior scrotal walls. This maneuver safeguards against torsion and testicular misalignment after extensive tissue removal

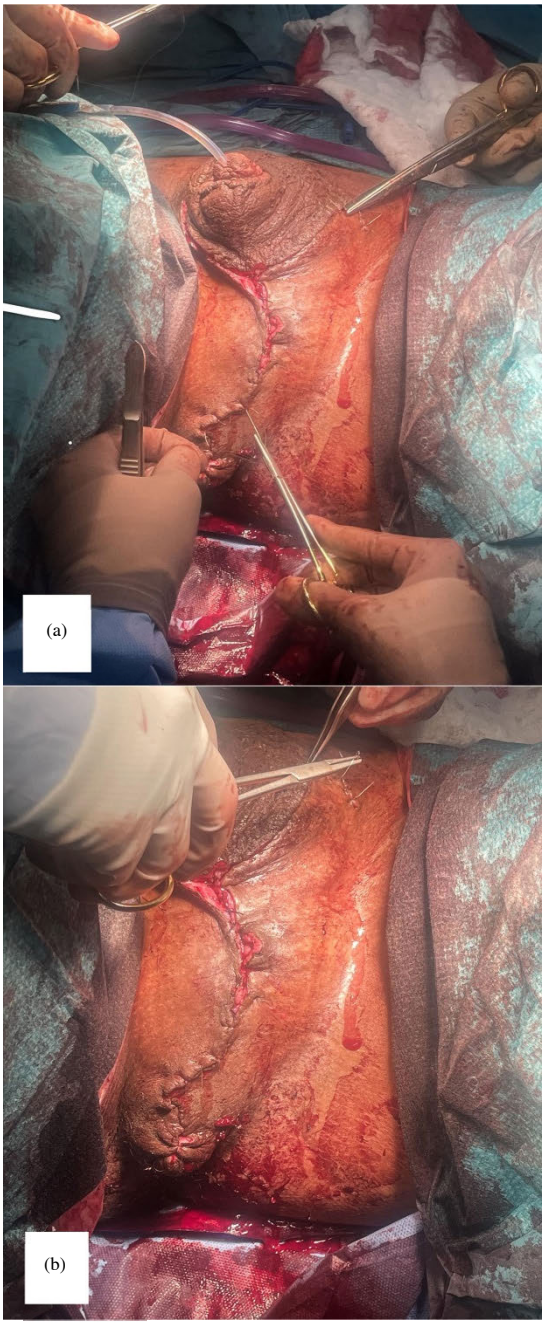

Figure 4(a-b): Final cutaneous closure, to provide a stable external scrotal contour post-excision in order to reduce complications and support improved function and hygiene

(nearly six points) indicates a marked enhancement in the patient's physical functioning. Specifically, the survey revealed that the patient perceived his general health as very good and reported no limitations in performing moderate activities, such as climbing several flights of stairs. Furthermore, he reported accomplishing his desired work output without significant physical limitations and expressed no limitations in the types of work or activities in which he could engage. Moreover, the patient reported that pain only moderately interfered with his normal work activities during the past week. Collectively, these findings suggest a significant improvement in the patient's physical well-being following the radical surgical intervention.

Conversely, his Mental Component Score (MCS-12) was 29.83, approximately 20 points below the U.S. population mean, indicative of ongoing psychological and emotional challenges. The patient reported experiencing intermittent episodes of being downhearted or blue,

Figure 5: Postoperative photograph at 1-month interval showing mild residual edema

acknowledging that his overall physical and emotional well-being occasionally impacted his social interactions. He also described periods of elevated mood, feeling calm and peaceful with increased energy levels. Despite these emotional fluctuations, his work productivity remained largely unaffected by his emotional state, as he reported no significant limitations in his ability to complete his duties. These detailed SF-12 assessments provide an objective baseline for his current health status and will serve as a valuable tool for ongoing monitoring and the implementation of individualized interventions to address his identified needs.

Follow-Up and Outcome

One month following the radical excisional procedure in August 2024, the patient exhibited mild residual scrotal swelling (Figure 5). While significantly reduced compared to his preoperative state, this lingering edema highlighted the chronic and relapsing potential of congenital lymphatic malformations. The patient reported marked improvement in his mobility and daily activities, noting a considerable improvement in his quality of life at 4-month intervals postoperatively.

DISCUSSION

Penoscrotal elephantiasis presents unique management challenges when extensive fibrofatty infiltration outstrips the ability of conservative approaches, such as sirolimus therapy or IR sclerotherapy, to maintain control [1].

Although sirolimus can hamper lymphangiogenic activity, its benefits often prove fleeting in advanced disease, particularly where non-pitting edema signals chronic fibrosis [3]. Sclerotherapies and lymphangiogram-guided glue embolizations help occlude discrete pathways, yet they cannot eliminate comprehensive tissue infiltration. Despite attempts at sirolimus (1-3 mg/day over seven months) and several IR-based glue embolizations, the patient's penoscrotal edema persisted. These interventions, while clinically valuable, often yield short-lived symptom relief unless disease infiltration remains localized or primarily fluid-based. In advanced fibrotic states, they serve mainly as supportive measures for controlling small pockets of residual edema or newly discovered reflux channels after radical surgery [3,5].

Consequently, radical excisional surgery often constitutes the pivotal intervention in advanced genital lymphedema, removing the bulk of pathological tissue to restore near normal anatomy [2]. This patient's radical excision exemplified how resecting nearly 5 kg of diseased scrotal skin alleviated mechanical burdens, improved functional capacity and resolved persistent infection risks.

The SF-12 serves as a valuable tool for reducing subjectivity in outcome assessments by providing a standardized metric for both physical and mental health [4]. With this defined set of responses, clinicians can objectively gauge improvements over time, establish a baseline for future assessments and tailor interventions accordingly. The use of SF-12 results not only facilitates consistent monitoring but also helps in setting measurable goals for both medical and psychosocial support. Consequently, structured psychosocial support programs or counseling may expedite emotional recovery, ensuring the patient derives maximal benefit from his improved physical state. This approach similarly lays a foundation for comparing future SF-12 scores to determine the trajectory of his recovery, diminishing subjectivity in subjective reporting and informing subsequent interventions.

Reflecting on the SF-12 results, outcomes suggest that the patient's physical health has improved considerably post-excision, as evidenced by a PCS-12 score well above the norm. However, emotional aspects remain mixed, consistent with a prolonged disease course marked by repeated relapses and multiple complex interventions. Chronic lymphedema can generate profound psychological burdens, including body image dissatisfaction and anxiety about potential recurrences [6].

The mild edema identified at follow-up one month postoperatively points to the inherent risk of partial recurrence in congenital lymphedema. If localized lesions arise, ongoing IR-based therapies, short-term sirolimus reintroductions or targeted sclerotherapies may be employed. Collaboration among urology, plastic surgery, interventional radiology and endocrinology remains indispensable, ensuring comprehensive coverage of potential relapses, endocrine anomalies and psychosocial factors.

CONCLUSIONS

This 16-year case of recurrent penoscrotal elephantiasis in a young male with congenital lymphatic malformation

illustrates the long and complex path to definitive management. Multiple attempts at sirolimus therapy (varying between 1 mg/day and 3 mg/day) and IR-based sclerotherapies afforded only short-term gains. The radical scrotal excision on August 2024 removed 4.935 kg of edematous skin and subcutaneous tissue, substantially alleviating the patient's disease burden and restoring daily function. Despite persistent mild residual edema observed during follow-up assessments, the patient reported a significant subjective improvement in both cosmetic appearance and organ functionality compared to the previous year. A structured follow-up, including IR sclerotherapies where needed and psychosocial support, will help preserve these results. Ultimately, radical excision stands as the crucial step in advanced genital lymphedema when conservative and limited surgical approaches cannot achieve persistent control.

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Data Statement

All relevant patient data have been embedded in the manuscript. Additional details are available upon request from the corresponding author, subject to institutional approval and confidentiality requirements.

Ethical Considerations

This case report was conducted in accordance with the Declaration of Helsinki. Formal ethical approval was waived because it describes a single, de-identified patient without additional experimental interventions. No Institutional Review Board (IRB) approval was required for case reporting under our local regulations.

Informed Consent Statement

Written informed consent was obtained from the patient for both treatment and publication of this case report (including all accompanying images). The patient was informed that no identifying information would be published and agreed to its submission in an anonymized format.

Author Contributions

1. Nalhathal: Conceptualized the study design and led the surgical approach, drafted core sections of the manuscript and critically revised the content.
2. R. Alqarni (corresponding author): Coordinated data acquisition, performed the SF-12 assessment, prepared the initial draft of the manuscript and integrated co-authors' input.
3. E. Almajed: Assisted in data collection, contributed to literature review and provided edits for clinical context and accuracy.
4. Almalki: Contributed surgical expertise, reviewed and refined the discussion and conclusion and ensured alignment with urological standards.
5. Aboukhshaba: Performed the detailed literature search, managed references and provided additional editorial feedback.
6. S. Kattan: Supervised overall project execution, validated final content and approved the final version prior to submission.

Word Count Clarification

The present case report totals approximately 1,626 words, falling below the journal's suggested 2,500-word minimum for a Case Report. However, we have adhered to the journal's content requirements and respectfully note that the guidelines allow some flexibility regarding length.

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Conflicts of Interest

All authors declare that they have no conflict of interest. The authors alone are responsible for the content and writing of this article.

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